

CIPARS 2020 Highlights

The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) monitors trends in antimicrobial use (AMU) and antimicrobial resistance (AMR) in foodborne bacteria from people, animal, and food sources across Canada.

Note: Sample and data collection for some CIPARS components was temporarily reduced or delayed due to the COVID-19 pandemic.

Integrated antimicrobial sales data

↑ 6.5%

Overall antimicrobial sales (kg) increased in production animals compared to 2019.

Antimicrobial sales (kg) in 2020 compared to 2019

- ↓ Poultry and aquaculture
- ↑ Beef cattle, pigs, and veal calves
- ≤1% CHANGE Dairy cattle, horses, and cats and dogs

Total antimicrobials sold (kg)

- 82% Production animals
- 17% People
- <1% Cats & dogs
- <1% Plant/crops

BUT 1.8x more antimicrobials sold for use in production animals than humans when adjusting for biomass.

Canada compared to Europe* in 2020

*European countries reporting to the European Surveillance of Veterinary Antimicrobial Consumption Network

6th HIGHEST quantity (mg/PCU*) of antimicrobials intended for use in production animals when compared to 31 European countries.

*mg/PCU (milligrams per population correction unit): An antimicrobial use indicator that adjusts the quantity of antimicrobial used, consumed, or sold for both the number and weight (or biomass) of animals or people in the population.

3^x HIGHER than the European median when measured by mg/PCU.

BUT In terms of Category I* antimicrobials... sales (mg/PCU) of third-generation cephalosporins only **slightly higher** and sales of fluoroquinolones **lower** than the European median.

*Category I antimicrobials: Antimicrobials classified as of very high importance to human medicine.

Take away messages

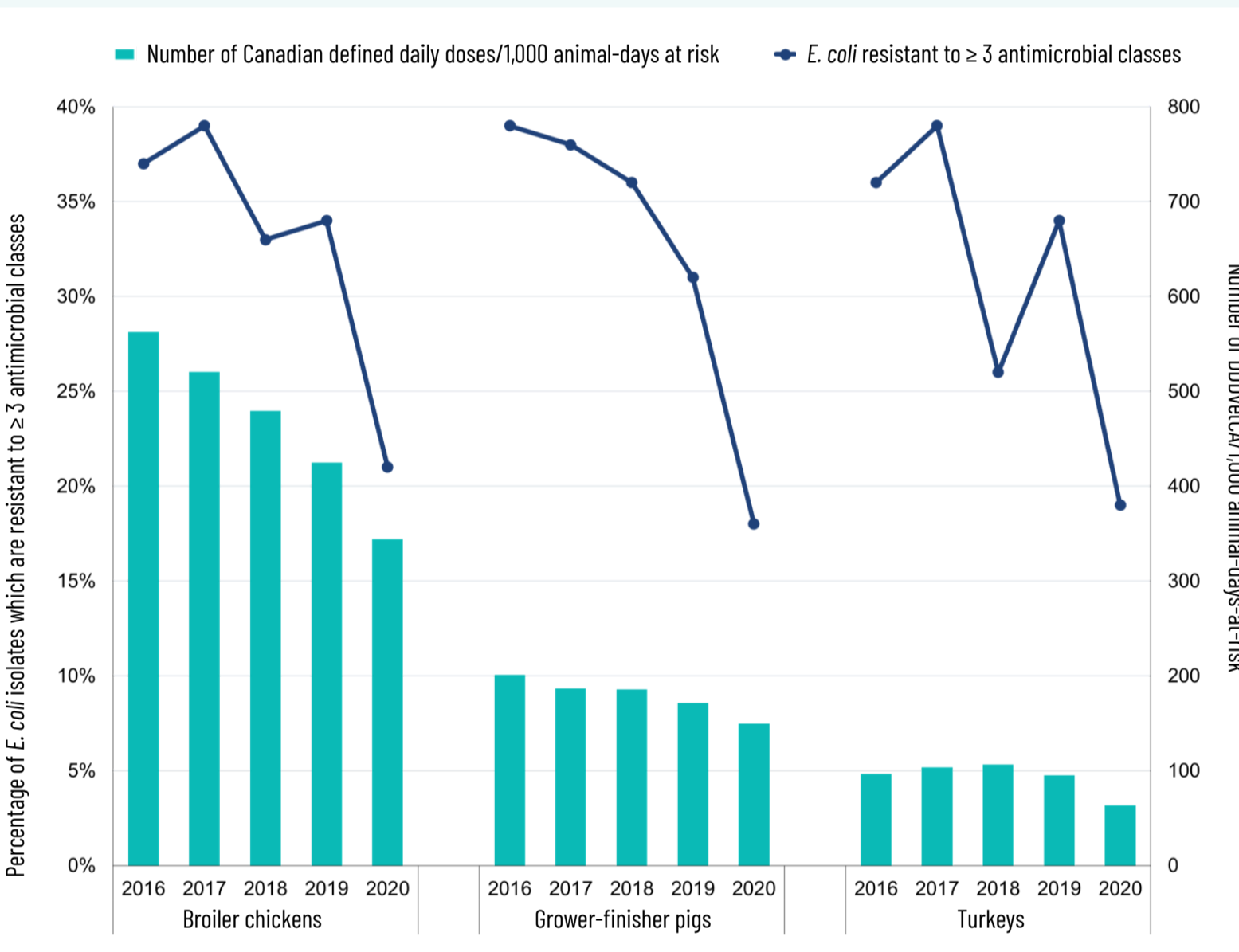
- Sales increased between 2019 and 2020, however, the overall trend in sales has decreased since 2018.
- These trends differ depending on the animal species.

Integrated farm AMU and AMR data from sentinel volunteer farms

Overall reported antimicrobial use **decreased** in poultry and pigs since 2016 (total nDDDvetCA/1,000 animal-days at risk*).

*nDDDvetCA/1,000 animal-days-at-risk (number of defined daily doses in per 1,000 animal-days-at-risk): An antimicrobial use indicator that accounts for the average labelled drug dose, the time at risk of exposure to antimicrobials, and the number and weight (or biomass) of animals in the population.

Spotlight: Sentinel farm surveillance of AMU and resistance in *E. coli* in broiler chickens, grower-finisher pigs, and turkeys from 2016 to 2020.



- ↓ Decrease in **resistance in bacteria** from samples from the same sentinel farms (using resistance to ≥ 3 classes of antimicrobials for *E. coli* as the indicator).
- ↓ Decrease in reported **antimicrobial use** on sentinel farms.

To Note:

- Trends coincided with the implementation of veterinary drug regulatory changes and policy interventions by Health Canada in 2017/18; medically important antimicrobials available by prescription only, removed growth promotion claims from all medically important antimicrobials.
- Changes have been made to reduce the use of medically important antimicrobials, including:
 - Sector-specific initiatives to eliminate the preventive use of third generation cephalosporins (and other antimicrobial classes in some cases).
 - Federal initiatives to update product labelling and improve access to antimicrobial alternatives.

Resistance to Category I antimicrobials (2020 compared to 2019):

- ↓ Ceftriaxone resistance in *Salmonella* **decreased** in pigs and broiler chickens.
- ↓ Ceftriaxone resistance in *E. coli* **decreased** in broiler chickens.
- ↓ Ciprofloxacin resistance in *Salmonella* **decreased** in turkeys.
- ↑ Nalidixic acid resistance in *Salmonella* **decreased** in turkeys but **increased** in broiler chickens.
- ↑ Ciprofloxacin resistance in *Campylobacter* **decreased** in turkeys but **increased** in broiler chickens.

Take away message

- Decreasing trends in antimicrobial use was accompanied by a decrease in multi-class resistance and resistance to Category I antimicrobials in most cases on broiler chickens, grower-finisher pigs, and turkey sentinel farms from 2016 to 2020.

Antimicrobial resistance

Healthy cattle at feedlot and abattoir

Campylobacter

- ★ **29%** IN 2020 Resistance to ciprofloxacin from healthy feedlot cattle has **increased** since 2017 to 29%.
- ↑ Resistance to ciprofloxacin from healthy cattle at abattoir has **increased** since 2016.

Salmonella

- ★ Small number of resistant *S. Heidelberg* detected for the first time on Alberta feedlots in 2019, but **none** were found in 2020.
- ! *Salmonella* was only recovered from cattle on **Ontario** feedlots (15 isolates) in 2020...
 - of which resistance was only to **Category III*** antimicrobials in...
 - 8 ISOLATES *Salmonella* Uganda
 - 5 ISOLATES *Salmonella* Muenchen

*Category III antimicrobials: antimicrobials classified as of medium importance to human medicine.

Colistin resistance

There is global concern for transmissible colistin resistance, therefore CIPARS conducts routine surveillance in production animals.

Detection of isolates phenotypically resistant to colistin in 2020

Salmonella Enteritidis and Salmonella Kiambu

1 isolate detected from caecal contents from healthy chickens at slaughter.

E. coli

1 isolate detected from a sample collected from a healthy grower-finisher pig on-farm.

E. coli

1 isolate detected from ground beef at retail.

BUT **None** of the isolates had transmissible colistin resistance.

Take away messages

- Given the threat of transmissible colistin resistance, CIPARS will continue to monitor for colistin resistance and contextualize findings when detected.
- Information from CIPARS supports measures to contain the emergence and spread of resistant bacteria between animals, food, and people, with the aim of preserving the effectiveness of antimicrobials.